PROPOSED NEW CLAIMS

28. A piezo-electric tag, comprising:

a) receiving means for receiving input radiation and generating a corresponding received signal;

b) piezo-electric vibrating means for increasing voltage magnitude of the received signal to generate a supply potential; and

c) electronic circuit means powerable by the supply potential.

29. The tag according to claim 28, wherein the vibrating means comprises a piezo-electric transformer incorporating mutually vibrationally coupled primary and secondary regions, the transformer being operable to be excited into vibration by the received signal at the primary region and to generate a corresponding output signal at the secondary region for use in generating the supply potential.

30. A tag according to claim 28, wherein the vibrating means comprises a piezo-electric bi-morph operable to be excited into vibration by the received signal and to generate a corresponding output signal for use in generating the supply potential.

31. The tag according to claim 28, wherein the vibrating means comprises a silicon micromachined device comprising an array of resonant elements, each element incorporating an associated piezo-electric transducer operable to generate an element signal in response to vibration of its associated element, the transducers being connected in series to add their element signals to provide an overall output from which the supply potential is

generated, and driving means operable to be driven by the received signal for stimulating the elements into vibration and thereby generating the supply potential.

32. The tag according to claim 31, wherein the resonant elements are operable at resonance to generate the supply potential.

33. The tag according to claim 31, wherein the resonant elements are housed in an evacuated environment for increasing their resonance Q factor.

34. The tag according to claim 28, wherein the receiving means incorporates demodulating means for demodulating modulation components present in the received radiation to generate the received signal.

35. The tag according to claim 34, wherein the demodulating means incorporates zero-bias Schottky diodes for demodulating the received radiation to generate the received signal.

36. The tag according to claim 34, wherein the demodulating means incorporates transistors operable as synchronous demodulators for demodulating the received radiation to generate the received signal.

37. The tag according to claim 28, wherein the circuit means is operable to function in a class C mode for reducing tag power consumption.

38. The tag according to claim 28, wherein the receiving means incorporates first and second antennas for generating the received signal for exciting the vibrating means, the first antenna being adapted to respond to microwave radiation, and the second antenna

being adapted to respond to radiation having a carrier frequency corresponding to a resonant frequency of the vibrating means.

39. The tag according to claim 28, wherein the receiving means incorporates at least one of a metallic film dipole antenna, a loop antenna and a patch antenna for at least one of receiving and emitting radiation.

40. The tag according to claim 28, wherein the circuit means comprises responding means for emitting output radiation from the tag, the responding means being powerable by the supply potential.

41. The tag according to claim 40, wherein the vibrating means is operable to recover a clock component of Manchester bi-phase encoded radiation received at the tag, and wherein the responding means is operable to use the clock component to demodulate the encoded radiation to generate corresponding demodulated data for use in the tag.

42. The tag according to claim 40, wherein the tag incorporates two antennas, one antenna for use in generating the received signal, and the other antenna incorporated into the responding means for at least one of emitting and receiving radiation.

43. The tag according to claim 40, wherein the antennas are conductive metallic film dipole antennas.

44. The tag according to claim 28, the tag having a form of a block.

45. The tag according to claim 28, the tag having a form of a planar card.

46. The tag according to claim 45, wherein the card incorporates recesses for accommodating the receiving means, the vibrating means and the responding means.

47. The tag according to claim 40, wherein the responding means is a transponder operable to receive input radiation to the tag and emit output radiation in response from the tag.

48. The tag according to claim 47, wherein the transponder is operable to modulate the output radiation with a signature code by which the tag is individually identified.

49. The tag according to claim 47, wherein the transponder incorporates a reflection amplifier for amplifying the input radiation to generate the output radiation.

50. The tag according to claim 47, wherein the transponder is operable in a pseudo-continuous mode and incorporates a delay line for delaying the output radiation relative to the input radiation, thereby counteracting spontaneous oscillation from arising within the transponder from feedback therein.

51. The tag according to claim 28, and a metallic earthing plane for providing a common signal earth for the tag.

52. The tag according to claim 28, and means for implantation into a biological system and operable for at least one of monitoring and stimulating the biological system.

53. A method of guiding a vehicle along a path to a destination, the method comprising the steps of:

a) distributing a plurality of piezo-electric tags along the path, and providing the vehicle with a direction sensitive interrogating source for transponding with the tags, each tag comprising receiving means for receiving input radiation and generating a corresponding received signal, piezo-electric vibrating means for increasing voltage magnitude of the received signal to generate a supply potential, and electronic circuit means powerable by the supply potential;

b) interrogating the tags from the source by emitting radiation to the tags and receiving radiation therefrom, thereby determining direction of the tags relative to the source and hence determining the path;

c) moving the vehicle along the path; and

d) repeating steps b) and c) until the vehicle reaches the destination.

54. A silicon micromachined device for receiving an input signal and generating a corresponding voltage magnitude enhanced output signal therefrom, the device comprising: an array of resonant elements, each element incorporating an associated piezo-electric transducer operable to generate an element signal in response to vibration of its associated element, the transducers being connected in series to add their element signals to provide the output signal, and driving means operable to be driven by the input signal for stimulating the elements into vibration and thereby generating the output signal.